Small Signal Schottky (double) diodes

BAT54S3/BAT54AS3
BAT54CS3/BAT54SS3

Description

Planar silicon Schottky barrier diodes encapsulated in a SOT-323 very small plastic SMD package. Single diodes and double diodes with different pinning are available.

Features

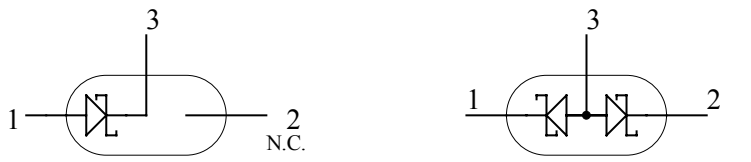
- Guard ring protected
- Low forward voltage drop
- Very small plastic SMD package
- Pb-free lead plating and halogen-free package

Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes

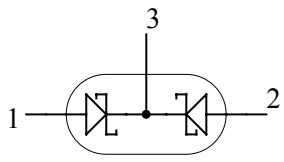
Pinning

Pin	Description			
	BAT54	BAT54A	BAT54C	BAT54S
1	A	K1	A1	A1
2	NC	K2	A2	K2
3	K	A1,A2	K1,K2	K1,A1

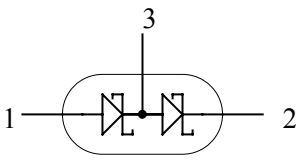


(1) BAT54

(2)BAT54A



(3)BAT54C

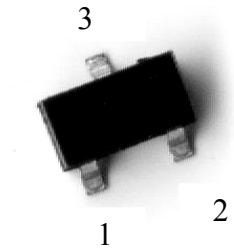


(4)BAT54S

Diode configuration and symbol

Outline

SOT-323



Marking:

Type	Marking Code
BAT54 S3	B4
BAT54AS3	B7
BAT54CS3	5C
BAT54SS3	B8

Absolute Maximum Ratings

Symbol	Parameter	Conditions	Min	Max	Unit
Per diode					
V_R	continuous reverse voltage		-	30	V
I_F	continuous forward current		-	200	mA
I_{FRM}	repetitive peak forward current	tp≤1s, δ≤0.5	-	300	mA
I_{FSM}	non-repetitive peak forward current	tp<10ms	-	600	mA
Ptot	total power dissipation (per package)	Tamb≤25℃	-	200	mW
Tstg	storage temperature		-65	+150	℃
Tj	operating junction temperature		-65	+150	℃
Tamb	operating ambient temperature		-65	+125	℃

Characteristics (Ta=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Min.	Max.	Unit
Reverse Breakdown Voltage	V_{BR}	I_R=100μA	30	-	V
Forward Voltage (Note 1)	V_F(1)	I_F=0.1mA	-	240	mV
	V_F(2)	I_F=1mA	-	320	mV
	V_F(3)	I_F=10mA	-	400	mV
	V_F(4)	I_F=30mA	-	500	mV
	V_F(5)	I_F=100mA	-	800	mV
Reverse Leakage Current (Note 2)	I_R	V_R=25V	-	2	μA
Diode Capacitance	C_D	V_R=1V, f=1MHz	-	10	pF
Reverse Recovery Time	trr	when switched from I_F= 10mA to I_R=10mA; R_L=100Ω; measured at I_R=1mA	-	5	ns

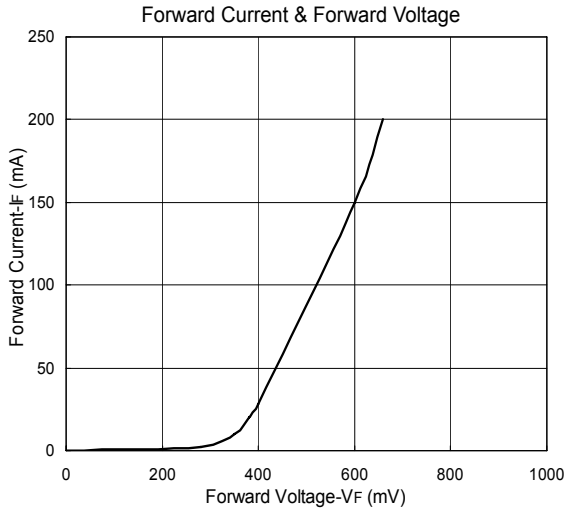
Notes: 1.pulse test, tp=380μs, duty cycle<2%.
2.pulse test, tp=300μs, duty cycle<2%.

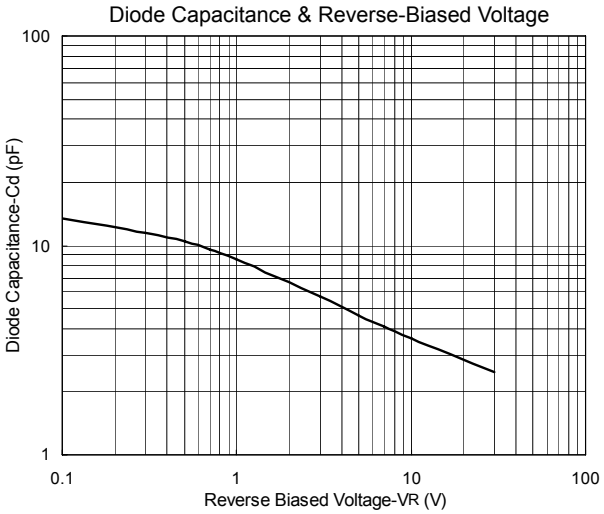
Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note 1 : Refer to SOT-323 standard mounting conditions.

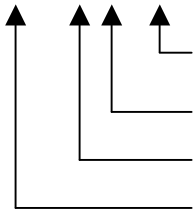
Typical Characteristics





Ordering Information

Device	Package	Shipping	Marking
BAT54S3-0-T1-G	SOT-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel	B4
BAT54AS3-0-T1-G			B7
BAT54CS3-0-T1-G			5C
BAT540SS3-0-T1-G			B8

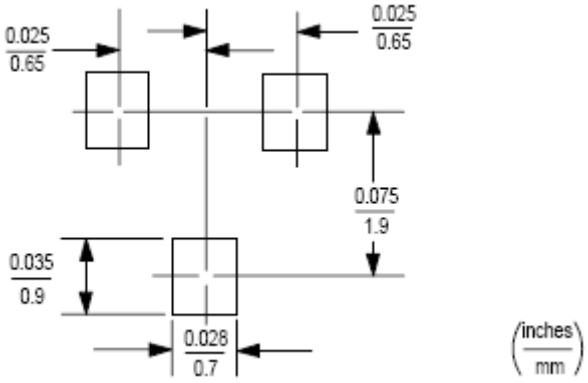


Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

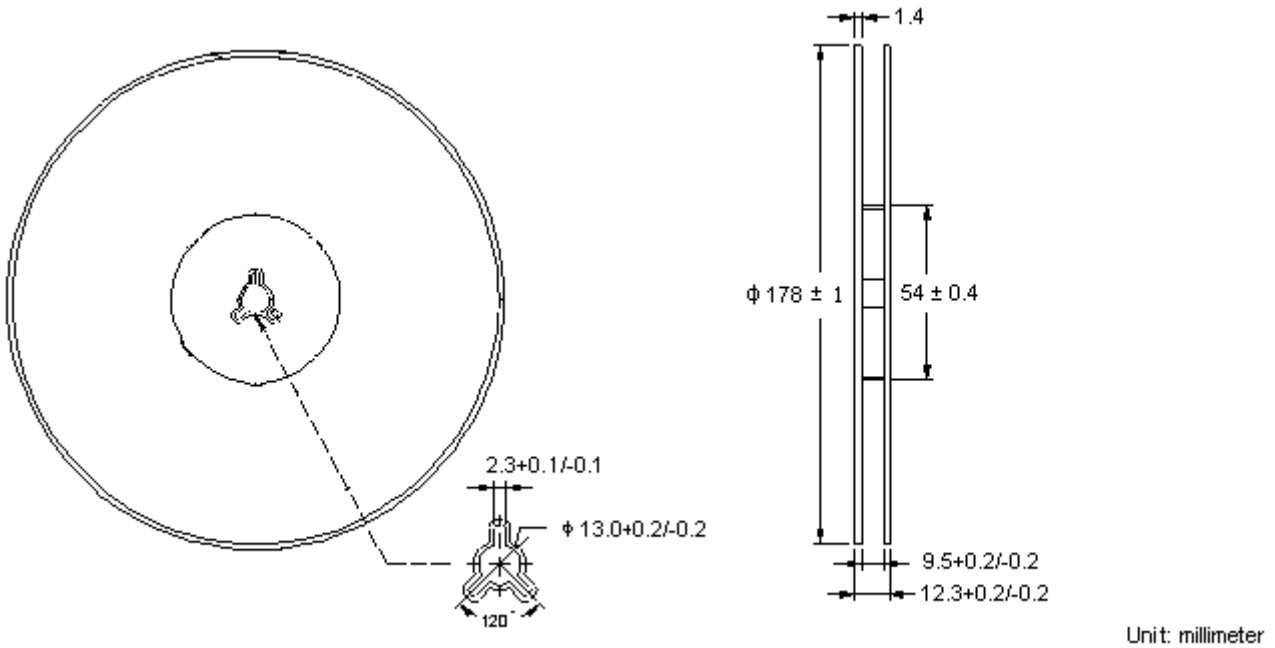
Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

Product name

Recommended Footprint

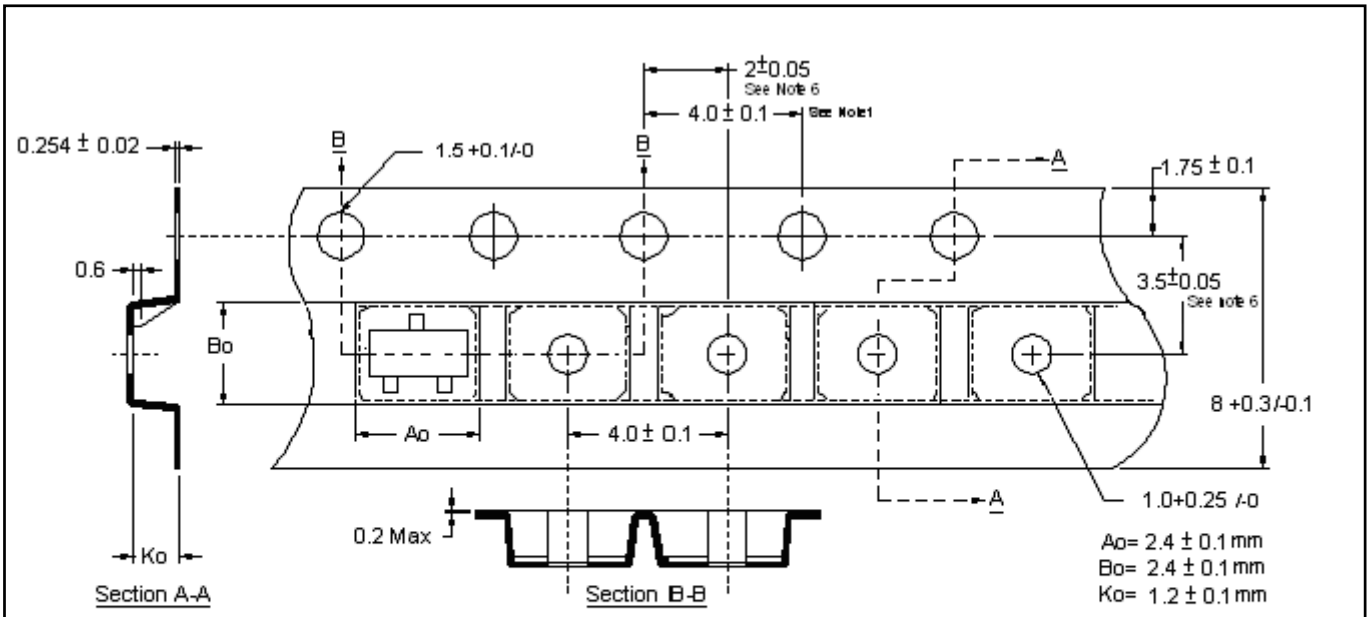


Reel Dimension



Unit: millimeter

Carrier Tape Dimension



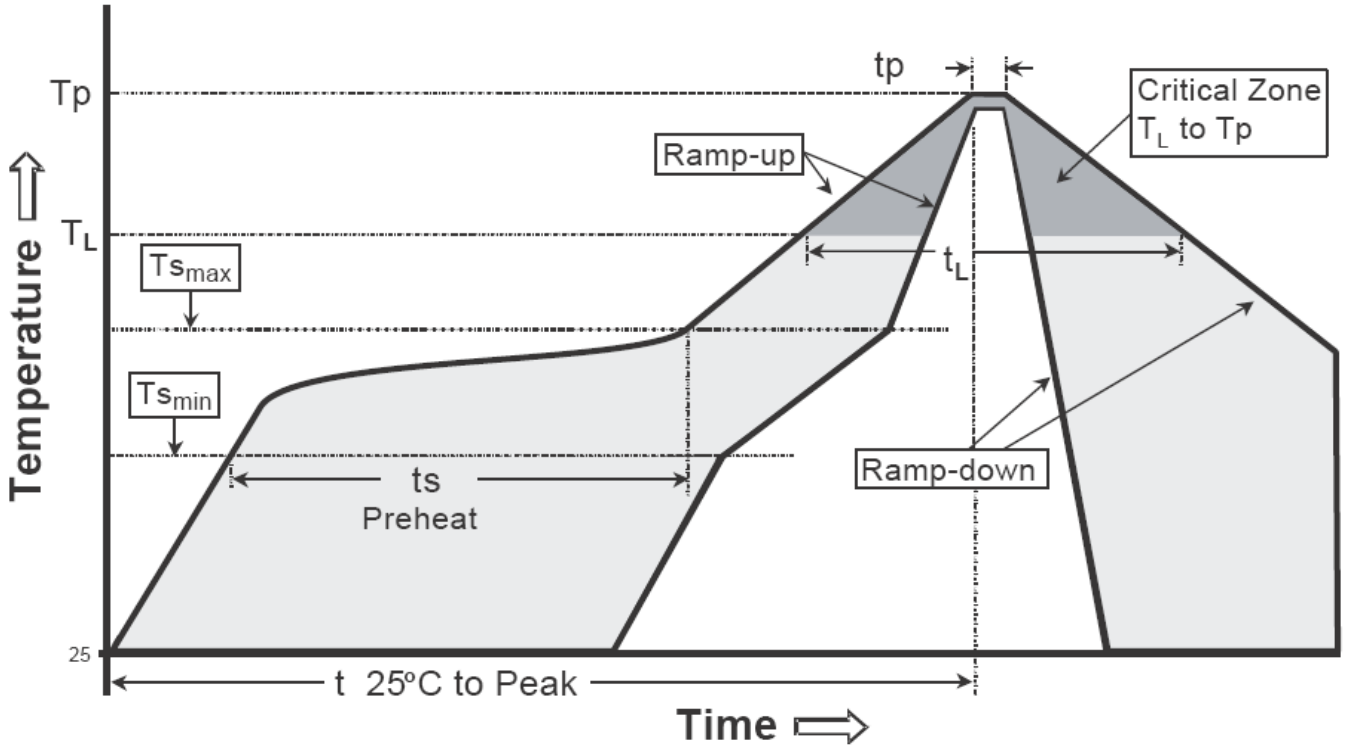
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

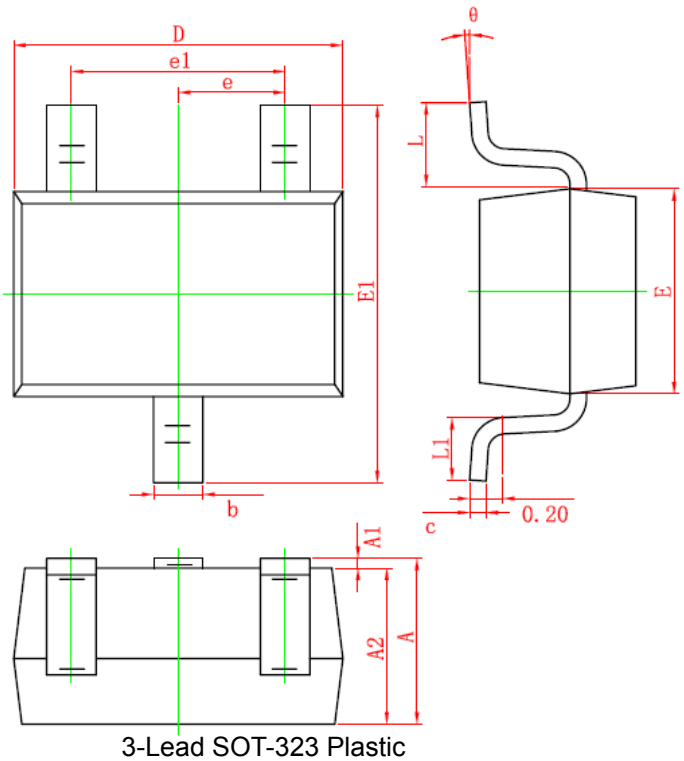
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-323 Dimension



3-Lead SOT-323 Plastic
Surface Mounted Package.
CYStek Package Code: S3

Marking:

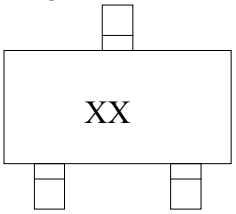
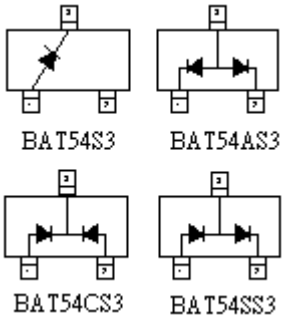


Diagram:



- BAT54 S3 : Single Diode (Marking Code B4)
- BAT54AS3 : Common Anode. (Marking Code B7)
- BAT54CS3 : Common Cathode. (Marking Code 5C)
- BAT54SS3 : Series Connected. (Marking Code B8)

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650 TYP		0.026 TYP	
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.200	0.400	0.008	0.016	L	0.525 REF		0.021 REF	
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.